# Refine Search

**Search Results -**

| Terms | Documents |
|---|---|
| L12 and L2 | 11 |

**Database:** US Pre-Grant Publication Full-Text Database; US Patents Full-Text Database; US OCR Full-Text Database; EPO Abstracts Database; JPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

**Search:** L14

Refine Search | Recall Text | Clear | Interrupt

## Search History

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| Set Name side by side | Query | Hit Count | Set Name result set |
|---|---|---|---|
| *DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR* | | | |
| L14 | L12 and l2 | 11 | L14 |
| L13 | l1 and l12 | 5 | L13 |
| L12 | l4 near l6 | 253 | L12 |
| L11 | l7 and L10 | 3 | L11 |
| L10 | stop$3 | 2231765 | L10 |
| L9 | l7 and L8 | 0 | L9 |
| L8 | zone | 909486 | L8 |
| L7 | l5 and L6 | 3 | L7 |
| L6 | distance | 2549393 | L6 |
| L5 | l3 and L4 | 3 | L5 |
| L4 | parking or backup | 161898 | L4 |
| L3 | l1 same L2 | 21 | L3 |
| L2 | low adj speed | 164301 | L2 |
| L1 | collision adj avoidance | 5003 | L1 |

END OF SEARCH HISTORY

# Refine Search

**Search Results -**

| Terms | Documents |
|---|---|
| L7 and L8 | 0 |

**Database:** US Pre-Grant Publication Full-Text Database; US Patents Full-Text Database; US OCR Full-Text Database; EPO Abstracts Database; JPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

**Search:** L9

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## Search History

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| L9 | l7 and L8 | 0 | L9 |
| L8 | zone | 909486 | L8 |
| L7 | l5 and L6 | 3 | L7 |
| L6 | distance | 2549393 | L6 |
| L5 | l3 and L4 | 3 | L5 |
| L4 | parking or backup | 161898 | L4 |
| L3 | l1 same L2 | 21 | L3 |
| L2 | low adj speed | 164301 | L2 |
| L1 | collision adj avoidance | 5003 | L1 |

END OF SEARCH HISTORY

# Refine Search

**Search Results -**

| Terms | Documents |
|---|---|
| L3 and L4 | 3 |

**Database:**
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**Search:** L5

Refine Search

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## Search History

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|---|---|---|---|
| *DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR* | | | |
| L5 | l3 and L4 | 3 | L5 |
| L4 | parking or backup | 161898 | L4 |
| L3 | l1 same L2 | 21 | L3 |
| L2 | low adj speed | 164301 | L2 |
| L1 | collision adj avoidance | 5003 | L1 |

END OF SEARCH HISTORY

# Refine Search

**Search Results -**

| Terms | Documents |
|---|---|
| L6 and L17 | 10 |

**Database:**

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JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

**Search:** L18

Refine Search

Recall Text | Clear | Interrupt

## Search History

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| Set Name side by side | Query | Hit Count | Set Name result set |
|---|---|---|---|
| *DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR* | | | |
| L18 | l6 and L17 | 10 | L18 |
| L17 | l10 and L16 | 18 | L17 |
| L16 | l4 and L15 | 37 | L16 |
| L15 | low adj speed adj collision | 286 | L15 |
| L14 | L12 and l2 | 11 | L14 |
| L13 | l1 and l12 | 5 | L13 |
| L12 | l4 near l6 | 253 | L12 |
| L11 | l7 and L10 | 3 | L11 |
| L10 | stop$3 | 2231765 | L10 |
| L9 | l7 and L8 | 0 | L9 |
| L8 | zone | 909486 | L8 |
| L7 | l5 and L6 | 3 | L7 |
| L6 | distance | 2549393 | L6 |
| L5 | l3 and L4 | 3 | L5 |

| | | | |
|---|---|---|---|
| L4 | parking or backup | 161898 | L4 |
| L3 | l1 same L2 | 21 | L3 |
| L2 | low adj speed | 164301 | L2 |
| L1 | collision adj avoidance | 5003 | L1 |

END OF SEARCH HISTORY

DOCUMENT-IDENTIFIER: US 6836717 B2
TITLE: Automotive bumper active energy absorption system

Detailed Description Text (6):
In operation, the active control system (hereinafter, "control system") 100 incorporates a data acquisition device 120 to obtain collision data. The data acquisition device 120 is a sensing device such as, but not limited to, a positional sensor, an accelerometer, a vehicle proximity system and the like. Such terms as sensor, proximity system, accelerometer and data acquisition device are taken to be equivalents and are used interchangeably throughout this specification. Collision data is the generated output of a data acquisition device 120. Collision data may be an analog or digitally encoded signal that represents a voltage or current proportional to a physical deflection for example, or other information such as measured or estimated velocities, for instance. A vehicle proximity system such as a Park Distance Control, Intelligent Cruise Control, or a type of Doppler proximity detection and the like, may be configured to determine closing rates for objects approaching a vehicle. Proximity systems are therefore capable of providing multiple types of collision data, such as closure rates, time to impact and estimated forces, among others and in several forms including, but not limited to, data structures, scripts or other types of executable code.

Detailed Description Text (29):
A modern automobile is a wonder of integration. Many automobiles include centralized electronic engine and system management functionality, including extensive diagnostic functions through a vehicle "brain" computer system. The system of the invention is capable of sensing an imminent low-speed collision and configuring the bumper to reduce the impact damage with the addition of a collision avoidance system employing a form of radar to provide constant data to the vehicle computer. The computer is enabled to recognize the collision data and to call separate subroutines or enable dedicated systems to both modulate the brake system and to configure the bumper dampers all in real time.

Detailed Description Text (30):
For example, a system-enabled automobile is navigating a parking lot. A second vehicle begins backing out of a parking space a few feet in front of the system-enabled automobile which triggers the collision avoidance system. The driver of the system-enabled automobile may or may not be applying force to the brake pedal, as a collision avoidance system is able of braking for the driver. The system-enabled auto is initially traveling at a low speed and an imminent collision will occur with a remaining speed of about 5 miles per hour at the collision point. The bumper dampers are configured for a low-speed impact based on data provided by the collision avoidance system.

Detailed Description Text (31):
In a second example, a system enabled automobile has a positional sensor mounted in the bumper. A driver of the vehicle approaches a red light with several cars in line in front. The roads are coated with compact snow and ice. The driver begins to slow 100 feet before the stopped cars but encounters the ice. The driver applies

full braking force and then pumps the brake pedal in an attempt to avoid a collision. The vehicle slows and eventually slides into the back of the automobile directly to the front. As the collision occurs at a low speed, the positional sensor detects a deflection of the bumper and the system configures the bumper damper to have full soft damping. The bumper is able to absorb the collision force with no damage to the vehicle. Additionally, the same scenario could have a third automobile colliding with the rear of the system-enabled vehicle with the same result; that is, a low-speed rear-end collision that causes no damage to the system-enabled vehicle. The system of the invention is equally able of retrofit to existing automobiles, where a bumper system containing the system is fitted to the front or rear.

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